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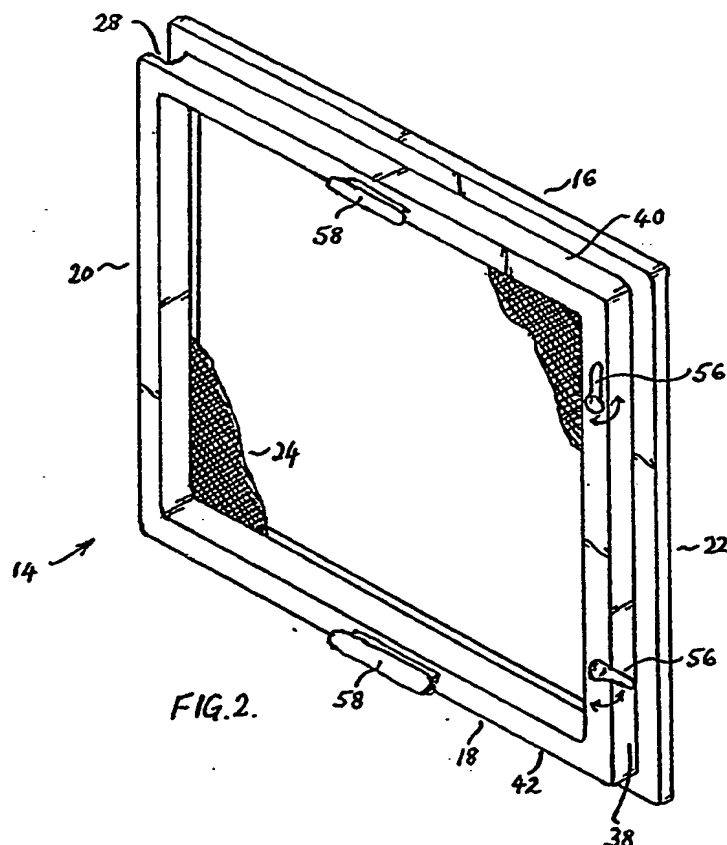
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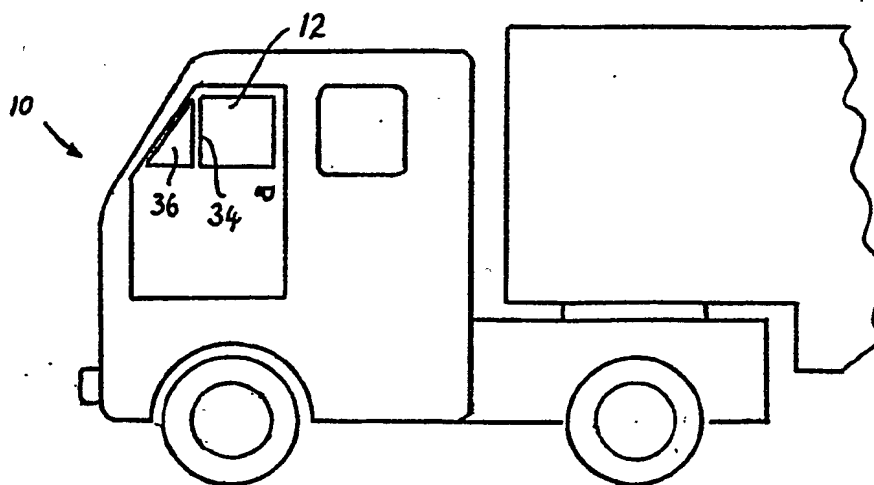
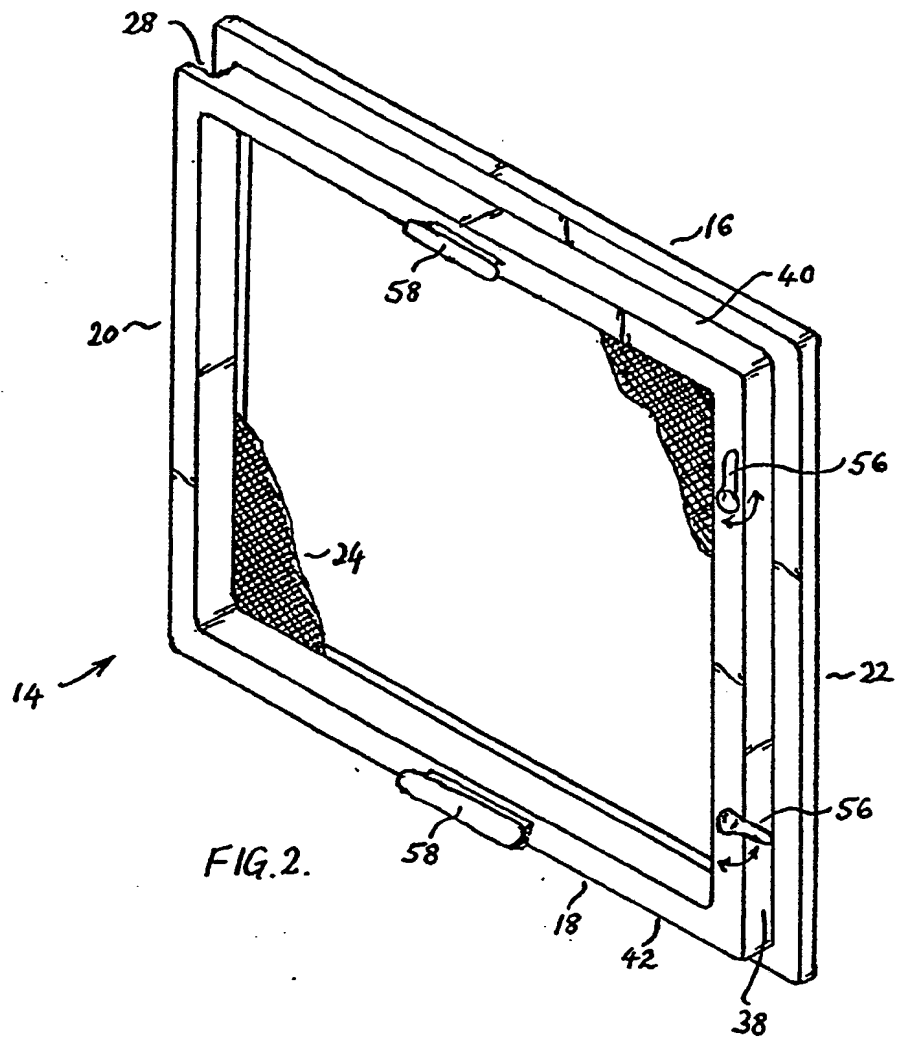
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INT CL<sup>4</sup> B60J, E06B

## (54) Ventilation of vehicles

(57) In order to provide ventilation for the cab of a commercial vehicle so that the driver can sleep more comfortably in hot weather during a break in his journey, but at the same time preventing biting or stinging insects from entering the cab, and maintaining the security of the vehicle, a ventilation device having a metal gauze screen 24 in a plastics frame 14 is fitted into an open window of the cab. Recesses, eg 20, in the frame and clips 56 allow fitting of the screen in the window opening of the vehicle.



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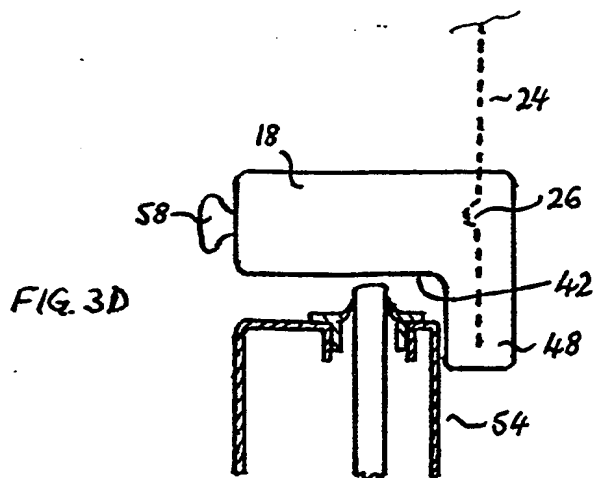
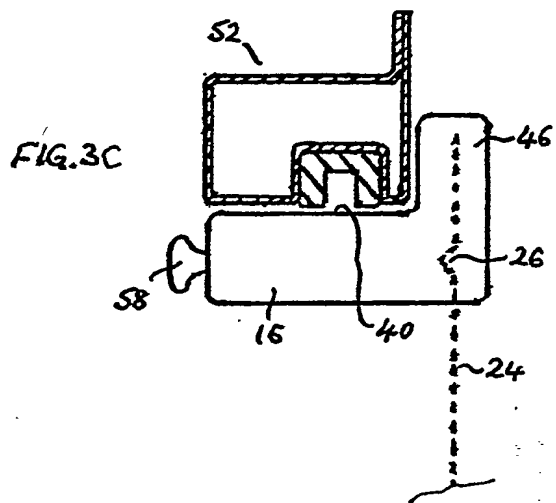
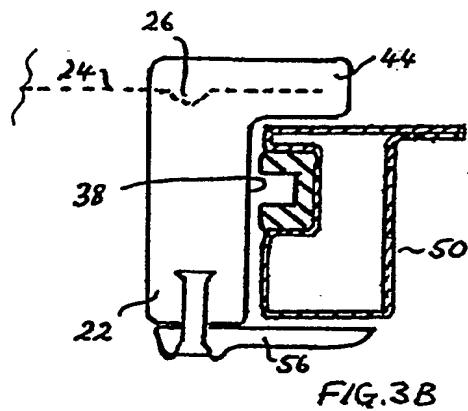
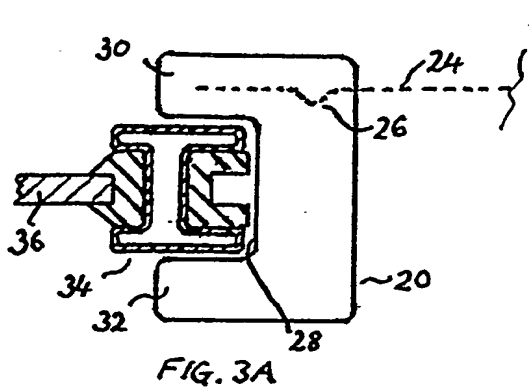


FIG. 4

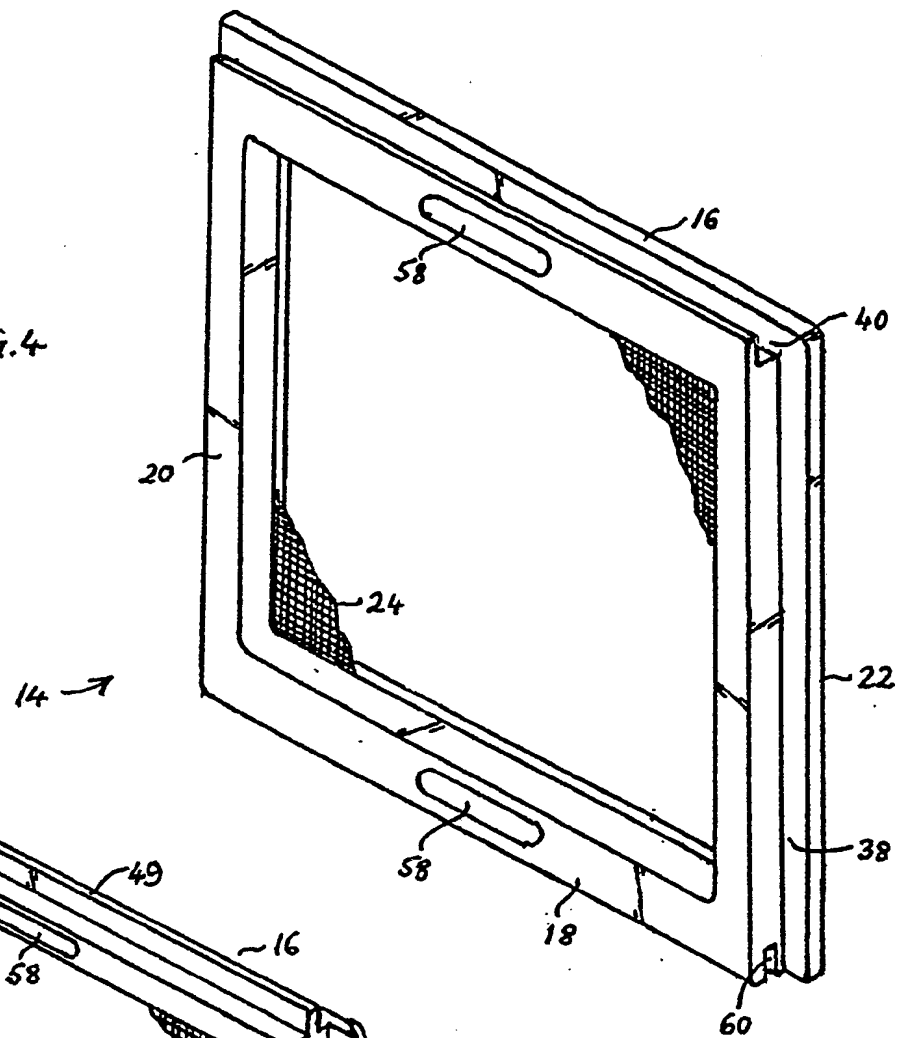
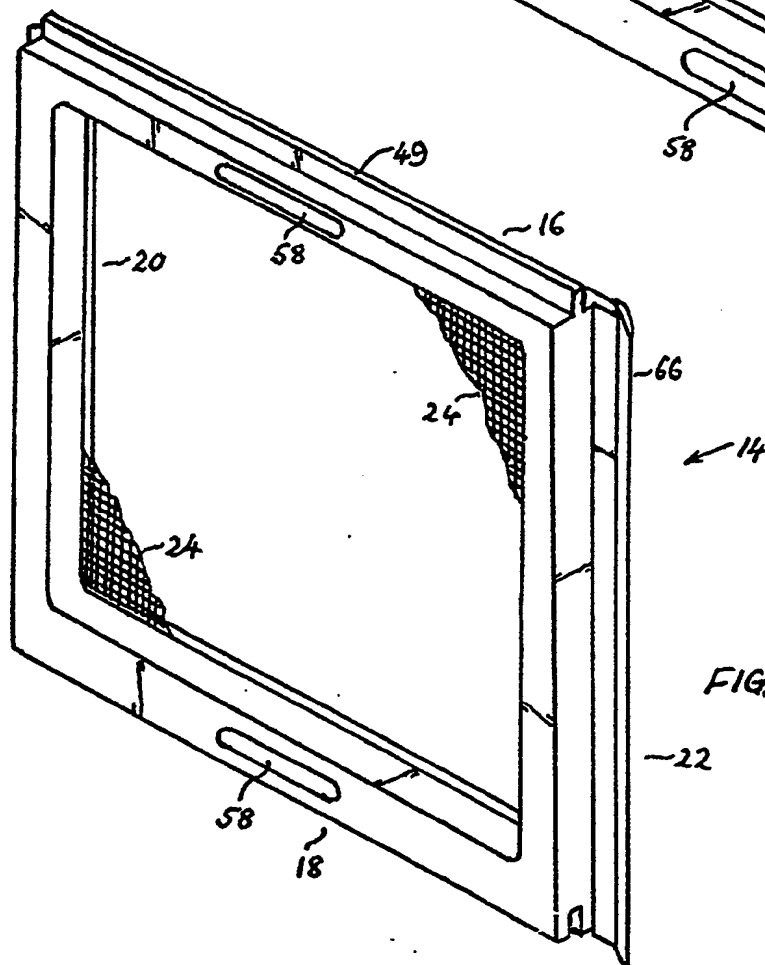


FIG. 6



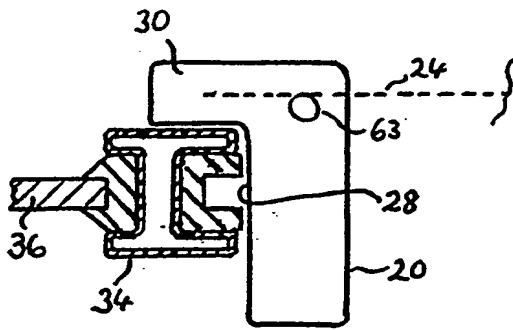


FIG. 5A

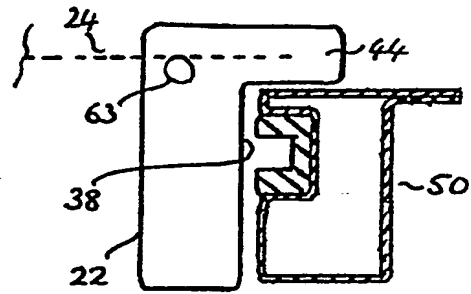


FIG. 5B

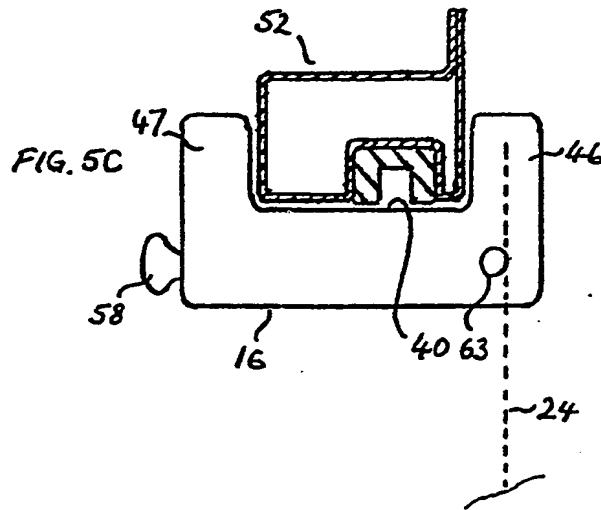


FIG. 5C

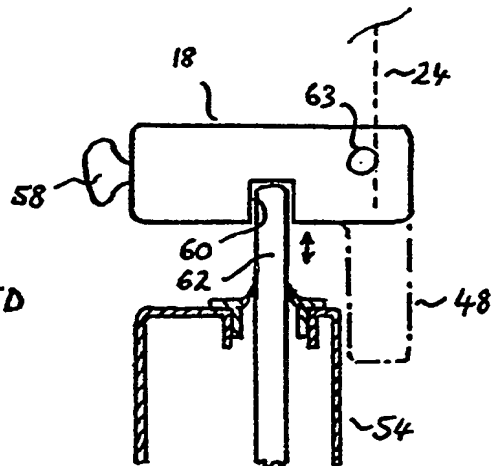
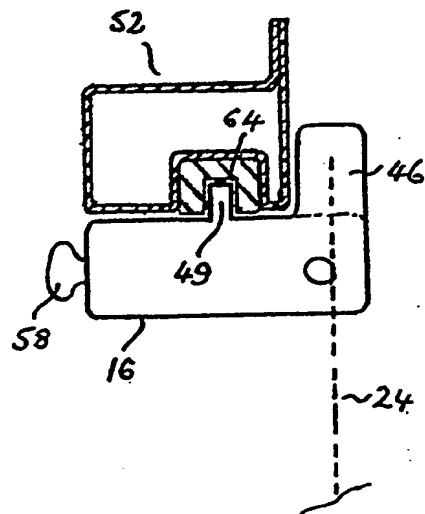


FIG. 5D

FIG. 7



*Description***VENTILATION OF VEHICLES**

This invention relates to the ventilation of vehicles, such as commercial vehicles, caravans and caravanettes, in which people may sleep.

Long distance lorry drivers commonly sleep in the cabs of their vehicles during a break in their journeys. In hot climates, especially in countries where mosquitos or other biting or stinging insects are prevalent, ventilation of the cab is a serious problem. The driver can close the cab windows and turn on the cab fans or air conditioning system to keep cool, but this is likely to drain the vehicle battery unduly and cause problems when trying to start-up the vehicle to resume the journey. Alternatively, he can leave the vehicle windows open, but in this case he may be bitten or stung by insects, and he risks being mugged and having his load or vehicle stolen. As a further alternative, he can sleep with the vehicle windows closed and the fans or air conditioning system switched off, in which case, in hot weather, the temperature in the cab may rise to an uncomfortable or unbearable level. Similar problems arise with caravans and caravanettes and in other situations.

The present invention overcomes the above problems by providing a screen device which can be fitted into an open vehicle window to allow fresh air to flow into the vehicle whilst at the same time providing a barrier to insects and keeping the vehicle and its occupant secure.

Specific embodiments of the present invention will now be described by way of example with reference to the accompanying drawings, in which:

**Figure 1** is a side view of a commercial vehicle to illustrate where a ventilator device in accordance with the present invention may be fitted;

**Figure 2** is a perspective view of one embodiment of ventilator device according to the present invention;

**Figures 3A to 3D** are cross-sectional views through the front and rear stiles and the upper and lower rails, respectively, of the device of **Figure 2**, also showing associated parts of the vehicle bodywork;

**Figure 4** is a perspective view of another embodiment of ventilator device according to the present invention;

**Figures 5A to 5D** are cross-sectional views through the front and rear stiles and the upper and lower rails, respectively, of the device of **Figure 4**, also showing associated parts of the vehicle bodywork;

**Figure 6** is a perspective view of a further embodiment of ventilator device according to the present invention; and

**Figure 7** is a cross-sectional view through the upper stile of the device of **Figure 4**.

Referring to **Figure 1** of the drawings, the cab 10 of a commercial vehicle has an openable side window 12 and a corresponding window on the other side of the cab. A pair of ventilator devices as described below are designed so that they can be fitted into the openings of these windows.



One form of ventilator device is shown in Figures 2 and 3 of the drawings. The device comprises a generally rectangular frame 14 having an upper rail 16, lower rail 18, front stile 20 and rear stile 22. Preferably, the frame is made of moulded plastics material which is both rigid and tough. The frame encircles a sheet of gauze 24 (only part of which is shown in Figure 2) which is preferably of metal and sufficiently thick to make it difficult for it to be cut by a thief or mugger, and which is perforated with holes sufficiently large to allow air to blow through the gauze, but sufficiently small to be impenetrable by mosquitos and other insects. The edges of the gauze are moulded into the frame and may have ridges 26 to help the plastics material of the frame to key to the gauze.

As shown particularly in Figure 3A, the outer edge of the front stile 20 is formed with a recess 28 between exterior and interior flanges 30, 32 to receive a pillar 34 between the quarterlight 36 and openable window of the cab (Figure 1). As shown particularly in Figures 3C to 3D, the outer edges of the rear stile 22 and top and bottom rails 16, 18 are formed with respective rabbets 38, 40, 42 having exterior flanges 44, 46, 48 to receive respective parts 50, 52, 54 of the vehicle bodywork around the other three sides of the openable window. The rear stile 22 is also provided with a pair of rotatable catches 56 on the interior side which can be twisted so that the vehicle bodywork 50 is held between the catches 56 and the flange 44.

In order to fit the ventilator device to the vehicle, the vehicle window is opened, the device is offered up to the window opening, and the recess 28 of the front stile 20 is engaged with the pillar 34. The device is then twisted slightly so that the other parts 50, 52, 54 of the vehicle bodywork engage with the rabbets 38, 40, 42 of the rear stile 22 and the top and bottom rails 16, 18. Then, the

catches on the rear stile 22 are twisted so that they engage the part 50 of the vehicle bodywork and lock the ventilator device in position. Removal of the device is carried out in the reverse order. When the device is fitted, the exterior flanges 30, 44, 46, 48 prevent the device being forced inwardly, and the interior flange 32 and catches 58 prevent the device being levered outwardly.

In order to facilitate manipulation of the device during fitting and removal, one or more handles 58 may be provided, for example integrally moulded with the upper and lower rails 16, 18.

It will be appreciated that locking devices other than the catches 56 may be employed, for example sliding bolts, or screws.

Figures 4 and 5 illustrate a modified ventilator device in which like features have been given the same reference numbers as in Figures 2 and 3. This modified device is similar to that described above, except in the following respects. The front stile 20 does not have an interior flange 32, and the rear stile does not have the catches 56. The top rail 16 does, however, have an interior flange 47, so that a recess 40, rather than a rabbet, is formed with the exterior flange to receive the part 52 of the vehicle bodywork. As shown particularly in Figure 5D, the bottom rail 18 does not necessarily have an exterior flange 48, although one may be provided as indicated by chain-dotted lines. However, a groove 60 is formed in the lower edge of the bottom rail 18 of a width sufficient to receive the top edge of the glass of the openable window 62.

In order to fit the ventilation device of Figures 4 and 5 to the vehicle, the window 62 is lowered completely, and the device is offered up to the window

opening. The upper recess 40 is engaged with the part 52 of the vehicle bodywork, and the groove 60 is aligned with the top edge of the glass of the window 62. The window is then raised so that its top edge engages in the groove 60 in the bottom rail of the device in order to lock the device in position.

Conveniently, many commercial vehicle windows are generally rectangular, but they are of many sizes. An advantage of the device of Figures 4 and 5, compared with that of Figures 2 and 3, is that although the width of the frame between the front and rear stiles needs to be fairly closely matched to the width of the window opening, the height of the frame between the upper and lower rails needs merely to be less than the height of the window opening, with the difference between the heights being taken up by the partial closure of the window. Therefore, in order to provide a range of devices to fit many sizes of window opening, there may need to be large range of widths in 20mm steps, for example, but only a small range of heights in, for example, 100mm steps, or indeed only one height of device needs to be made available.

A further modification is shown in Figures 4 and 5 in that the gauze is fixed, for example by spot welding, to a steel rod frame 63 which is moulded into the plastics frame of the device. This provides very good keying of the gauze to the plastics material and improves the strength and rigidity of the frame.

Further modifications are shown in Figures 6 and 7. The device is similar to that of Figures 4 and 5 with the exception that, instead of having an interior flange 47, and possibly also instead of having an exterior flange 46, the top rail 16 has a tongue 49 which is of a width such that it can be fitted into the window channel 64 in the upper part of the vehicle bodywork which normally receives the upper edge of the window glass when the window is closed.

As is further shown in Figure 6, the front and rear stiles 20, 22 have flexible sealing strips 66 which are arranged to abut the parts 34, 50 of the vehicle bodywork when the device is fitted to the vehicle to increase the impenetrability of the device to mosquitos and other insects.

Whilst various specific embodiments of the invention have been described above in relation to a ventilator device for a commercial vehicle, it will be appreciated that many other modifications may be made to the device and that the device may be used other than for commercial vehicles.

*Claims*

1. A ventilation device for a vehicle, comprising:  
a frame having a shape complementary to that of an opening provided by an openable window of the vehicle;  
a screen of air-permeable material mounted within the frame; and  
means for attaching the frame to the vehicle in the window opening.
2. A device as claimed in claim 1, wherein the attaching means comprises a formation on a first side of the frame which is arranged to engage the vehicle, and one or more locking elements on a second side of the frame which can be manually operated to engage the vehicle.
3. A device as claimed in claim 2, wherein said second side of the frame has a flange to engage the exterior of the vehicle, and the or each locking element is arranged to engage the vehicle interiorly of the flange.
4. A device as claimed in claim 1, wherein the attaching means comprises a formation on a first side of the frame which is arranged to engage the vehicle, and a groove on a second side of the frame which is arranged to receive the edge of the openable window.
5. A device as claimed in any of claims 2 to 4, wherein the formation on the first side of the frame is a recess which is arranged to receive a part of the vehicle bodywork.

6. A device as claimed in any of claims 2 to 4, wherein the formation on the first side of the frame is a tongue which is arranged to be inserted into a window channel of the vehicle bodywork.

7. A device as claimed in any of claims 2 to 6, wherein third and fourth sides of the frame have flanges to engage the exterior of the vehicle bodywork.

8. A device as claimed in any preceding claim, wherein the frame is formed of moulded material, the edges of the screen being moulded into the frame.

9. A ventilation device for a vehicle, substantially as described with reference to the drawings.

10. A vehicle having an openable window, in combination with a ventilation device, as claimed in any preceding claim, fitted into the window opening.